

Meacham
U.S. Serial No. 10/802,476
Page 2 of 6

Amendments to the claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of claims:

Claim 1 (previously presented): A metallic barrier separating oxygen containing gas and hydrogen containing gas, comprising:

one or more fluidly connected pores leading from an interior of the barrier to one or more barrier surfaces,

wherein at least a portion of the metallic barrier comprises a noble metal.

Claim 2 (original): The metallic barrier of claim 1, wherein the barrier surfaces are contacted by the hydrogen containing gas.

Claim 3 (original): The metallic barrier of claim 1, wherein the barrier surfaces are contacted by the oxygen containing gas.

Claim 4 (previously presented): The metallic barrier of claim 1, wherein

at least a first portion of the fluidly connected pores is connected to barrier surfaces contacted by the oxygen containing gas, and

at least a second portion of the fluidly connected pores is connected to barrier surfaces contacted by the hydrogen containing gas.

Claim 5 (previously presented): The metallic barrier of claim 1, wherein the fluidly connected pores extend from barrier surfaces contacted by the oxygen containing gas to barrier surfaces contacted by the hydrogen containing gas.

Claim 6 (canceled)

Meacham
U.S. Serial No. 10/802,476
Page 3 of 6

Claim 7 (currently amended): The metallic barrier of claim 1, wherein ~~barrier surfaces contacted by the oxygen containing gas~~ contacts the portion of the metallic barrier that comprises a the noble metal.

Claim 8 (currently amended): The metallic barrier of claim 1, wherein ~~barrier surfaces contacted by the hydrogen containing gas~~ contacts ~~comprise~~ copper or nickel, the copper or nickel being in contact with the portion of the metallic barrier that comprises the noble metal.

Claim 9 (currently amended): The metallic barrier of claim 1, wherein the metallic barrier further comprises ceramic particles selected from the group consisting of: alumina, zirconia, and lanthanum chromite, the ceramic particles being in contact with the portion of the metallic barrier that comprises the noble metal.

Claim 10 (currently amended): The metallic barrier of claim 1, wherein the metallic barrier further comprises metal oxide particles including at least one metal selected from the group consisting of: copper, nickel, palladium, platinum, rhodium, iridium, iron, and ruthenium, the metal oxide particles being in contact with the portion of the metallic barrier that comprises the noble metal.

Claim 11 (currently amended): The metallic barrier of claim 1, wherein the metallic barrier comprises copper or nickel, and further comprises particles selected from the group consisting of: alumina, zirconia, and lanthanum chromite, the particles being in contact with the portion of the metallic barrier that comprises the noble metal.

Claim 12 (previously presented): A method of separating gas A from gas B with a barrier, comprising the steps of:

providing the barrier made of a barrier material including at least a noble metal, such that the gases A and B are both soluble in and diffuse through the barrier material,

forming a product gas C by reacting the gases A and B with each other within the barrier material, the product gas C being substantially insoluble in the barrier material; and

Meacham
U.S. Serial No. 10/802,476
Page 4 of 6

venting the product gas C through a plurality of pores leading from an interior of the barrier material to one or more barrier surfaces, so as to limit the pressure of the product gas C within the barrier material.

Claim 13 (original): The method of claim 12, wherein the gas A contains oxygen, the gas B contains hydrogen, and the product gas C comprises steam.

Claim 14 (original): The method of claim 12, wherein the barrier material is inert relative to the gases A and B and the product gas C.

Claim 15 (original): The method of claim 14, wherein the composition of the barrier material varies according to position within the barrier such that the gases A, B and the product gas C only contact material inert to the gases A, B and the product gas C respectively.

Claim 16 (currently amended): The method of claim 14, wherein at least a portion of the barrier material is an electronically conductive metal in contact with the noble metal of the barrier.

Claim 17 (canceled)

Claim 18 (currently amended): The method of claim 14, wherein at least a portion of the barrier material is an oxide, ceramic or glass in contact with the noble metal of the barrier.

Claim 19 (previously presented): The method of claim 12, wherein the absolute pressure of the product gas C in one of the plurality of pores is higher than the absolute pressure of the gas A or the product gas C at a pore opening, such that outward flow of the product gas C prevents entry of the gas A or the product gas C.

Claim 20 (previously presented): The method of claim 12, wherein the absolute pressure of the product gas C in one or more of the plurality of pores is below a level that causes structural damage to the barrier material.

Meacham
U.S. Serial No. 10/802,476
Page 5 of 6

Claim 21 (previously presented): A solid oxide fuel cell, comprising:

a barrier having a first face, a second face, and a plurality of pores leading from an interior of the barrier to the first or second faces, wherein at least a portion of the barrier comprises a noble metal;

an oxygen-containing gas contacting the first face of the barrier; and

a hydrogen-containing gas contacting the second face of the barrier;

wherein the oxygen-containing gas and the hydrogen-containing gas diffuse into the barrier and react to form a mixture of steam, the mixture being vented through the pores to the first or second faces.

Claim 22 (original): The solid oxide fuel cell of claim 21, wherein the pores are connected to the first face of the barrier.

Claim 23 (original): The solid oxide fuel cell of claim 21, wherein the pores are connected to the second face of the barrier.

Claim 24 (original): The solid oxide fuel cell of claim 21, wherein the pores are connected to both the first and second faces of the barrier.

Claim 25 (canceled)